



DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS



26 JULY 2017

MEMORANDUM FOR SGMSS

ATTN: MAJ MATTHEW S BROCK

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

Your paper, entitled **An Initial Report on Nightmares in Active Duty Service Members with Sleep Disturbances** presented at/published to **Military Health System Research Symposium (MHSRS) 8/29/2017** in accordance with MDWI 41-108, has been approved and assigned local file #**17289**.

Pertinent biographic information (name of author(s) title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist's Office, Ms. Alice Houy, office phone: 210-292-8029; email address: alice.houy.civ@mail.mil.

Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC
Director, Clinical Investigations & Research Support

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

INSTRUCTIONS

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 - b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.
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5. PROTOCOL TITLE: (NOTE: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.) An Initial Report on Nightmares in Active Duty Service Members with Sleep Disturbances			
6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED: An Initial Report on Nightmares in Active Duty Service Members with Sleep Disturbances			
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14. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email) Brock, Matthew, S, matthew.s.brock.mil@mail.mil			15. DUTY PHONE/PAGER NUMBER 210-292-1305
16. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.			
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a. Primary/Corresponding Author Jennifer Creamer	MAJ	59 MDW/SGVT	
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21. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE Laura M. Baugh, Lt Col, O-5		22. APPROVING AUTHORITY'S SIGNATURE BAUGH.LAURA.M.1081611196	23. DATE 22 July 2017

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Clinical and PSG Correlates of Nightmares in US Military Personnel

Major Matthew S. Brock, MD
Chief, SAMHS Sleep Disorders Center

Disclaimer

- The views expressed are those of the presenter and do not reflect the official views or policy of the Department of Defense or its Components

Nightmare Disorder (NDO)

- Repeated occurrences of disturbing, well-remembered dreams that cause clinically significant distress or impairment
- Trauma related nightmares (TRN) follow a traumatic experience
- Clinically significant nightmares occur at least weekly
- Few studies evaluate NDO in military personnel
- Prior polysomnogram (PSG) findings in NDO have been inconclusive

Nightmares: Prevalence among the Finnish General Adult Population and War Veterans during 1972-2007

Nils Sandman, MSc^{1,2}, Katja Valli, PhD^{2,3}, Erkki Kronholm, PhD², Hanna M. Ollila, PhD¹, Antti Revonsuo, PhD^{2,3}, Tiina Laatikainen, PhD^{4,5}, Tiina Paunio, MD, PhD^{1,6}

Frequent nightmares

- Men: 3.5%
- Women: 4.8%
($p < 0.0001$)

Prevalence affected by

- Sex
- Age
- Year of survey

War experiences

- ↑ nightmares
- ↑ insomnia

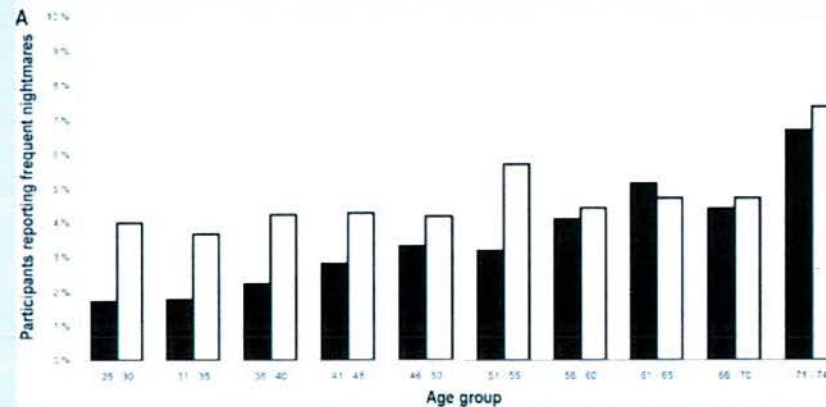


Table 5—Nightmares and symptoms of insomnia, depression, and anxiety among the war generation and the general population in the combined sample of participants of the years 1972, 1977, 1982, 1987, and 1997

	General population		War generation	
	Men	Women	Men	Women
n	17,705	17,754	5,300	5,915
Nightmares often (%)	2.8	4.6	7.2	7.0
Insomnia often (%)	5.4	6.1	10.9	13.9
Depressed often (%)	3.7	6.5	7.1	9.6
Anxious often (%)	7.3	9.8	11.0	12.0

SLEEP 2013;36(7):1041-1050.

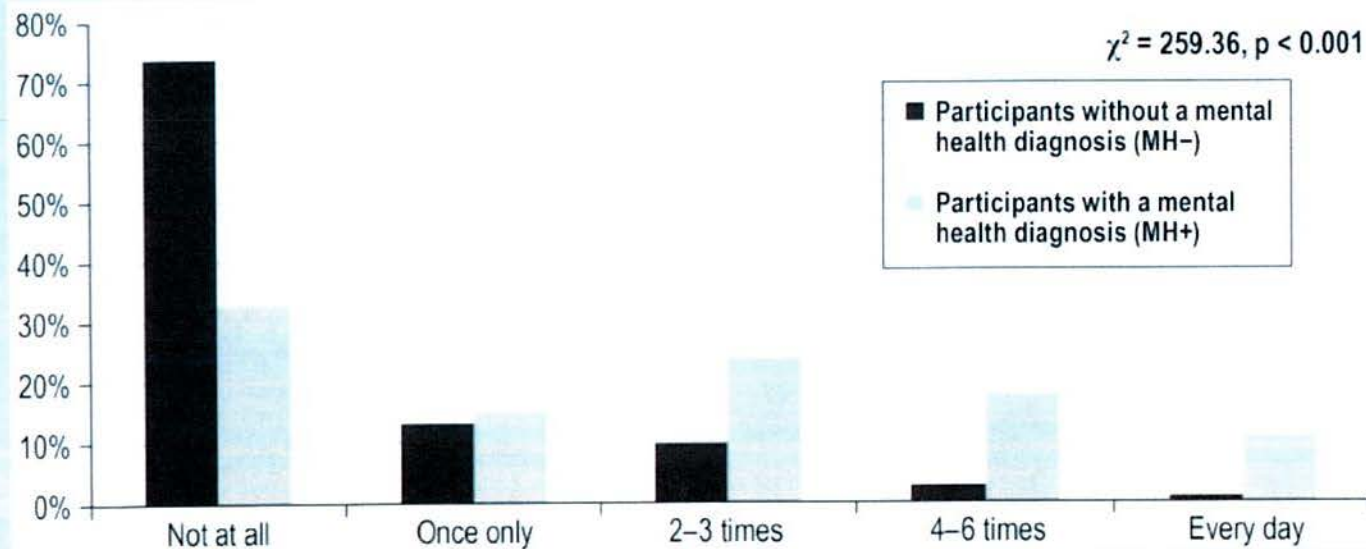
A Comparison of Sleep Difficulties among Iraq/Afghanistan Theater Veterans with and without Mental Health Diagnoses

Christi S. Ulmer, PhD^{1,2}, Elizabeth Van Voorhees, PhD^{1,2}, Anne E. Germain, PhD³, Corrine I. Voils, PhD⁴, Jean C. Beckham, PhD^{1,2,5},
the VA Mid-Atlantic Mental Illness Research Education and Clinical Center Registry Workgroup⁵

¹Durham Veterans Affairs Medical Center, Durham, NC; ²Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC; ³University of Pittsburgh, Departments of Psychiatry and Psychology, Pittsburgh, PA.

⁴Department of General Internal Medicine, Duke University Medical Center, Durham, NC; ⁵VISN 6 Mental Illness Research, Education, and Clinical Center, Durham, NC

J Clin Sleep Med 2015;11(9):995-1005.



Distressing dreams of a traumatic event (frequency)

Nightmares

- Associated with anxiety, depression, and PTSD
- Associated with heightened risk of suicidal ideation
- Treatment can lead to improvement in comorbid anxiety, depression, and PTSD



Methods

- Retrospective review of 500 military personnel with sleep disturbances
 - 7 omitted due to incomplete data
- Medical record and PSGs evaluated for:
 - Pittsburgh Sleep Quality Index:
 - Nightmare/TRN
 - Self reported sleep measures
 - Standardized sleep questionnaires:
 - Epworth Sleepiness Scale (ESS)
 - Insomnia Severity Index (ISI)
 - Anxiety, depression, PTSD, TBI
 - PSG variables

Statistical Analysis

- α level of 0.05 was used to determine statistical significance
- Analysis of Variance (ANOVA) and the Wilcoxon rank sum test were used for pairwise comparisons
- Fisher's Exact test was used for comparisons of proportions
- Benjamini-Hochberg False Discovery Rate (BH-FDR) was used to assess for post-hoc statistical significance

Results

	Entire sample (N=493)	NDO (n=154)	Non-NDO (n=339)	Un-adjusted <i>p</i> Value
Demographics				
Age, years M±SD	37.7±8.99	37.8±9.02	37.7±8.99	0.909 ^A
Sex, Males % (No.)	78.5% (387)	73.4% (113)	80.8% (274)	0.076 ^B
Deployment, yes % (No.)	73.6% (363)	78.6% (121)	71.4% (242)	0.099 ^B
Self-reported measures, M±SD				
ESS score	12.6±4.78	12.9±4.94	12.4±4.71	0.405 ^A
ISI score	16.5±5.53	19.5±4.99	15.2±5.29	<0.001 ^{A,C}
Reported time in bed (hours)	7.23±1.30	7.34±1.37	7.18±1.27	0.229
Reported sleep time (hours)	5.21±1.43	4.78±1.46	5.40±1.38	<0.001 ^{A,C}
Reported sleep efficiency (%)	73.4±19.0	66.9±20.2	76.3±17.6	<0.001 ^{A,C}

^A One-way ANOVA

^B Comparison with Fisher's Exact test

^C Statistically significant according to post-hoc analysis with the BH-FDR controlling procedure

ESS Epworth Sleepiness Scale; ISI Insomnia Severity Index

Results

Disorder group	NDO (n=154) % (No.)	Non-NDO (n=339) % (No.)	Un-adjusted <i>p</i> Value ^A	Relative risk NDO versus Non-NDO RR (95% CI)
Elevated daytime sleepiness (ESS score>10)	68.4% (104)	68.4% (232)	>0.99	-
Insomnia (ISI score≥15)	86.2% (131)	54.2% (182)	<0.001 ^B	1.59 (1.42 – 1.79)
OSA, % (No.)				
Overall occurrence	73.4% (113)	74.6% (253)	0.824	-
Severity			0.740	-
Mild (5<AHI≤15)	42.9% (66)	38.9% (132)	-	-
Moderate (15<AHI≤30)	16.2% (25)	19.2% (65)	-	-
Severe (AHI>30)	14.3% (22)	16.5% (56)	-	-
TBI	13.0% (20)	6.49% (22)	0.023	-
PTSD	42.2% (65)	8.26% (28)	<0.001 ^B	5.11 (3.43 – 7.62)
Anxiety	44.8% (69)	17.4% (59)	<0.001 ^B	2.57 (1.93 – 3.44)
Depression	42.9% (66)	12.1% (41)	<0.001 ^B	3.55 (2.52 – 4.98)

^A Statistical comparisons between NDO and non-NDO groups with Fisher's Exact Test

^B Statistically significant according to post-hoc analysis with the BH-FDR controlling procedure

ESS Epworth Sleepiness Scale; ISI Insomnia Severity Index; TBI Traumatic Brain Injury; OSA Obstructive Sleep Apnea; PTSD Post-Traumatic Stress Disorder

Results

PSG variables, M±SD	Entire sample (N=493)	NDO (n=154) % (No.)	Non-NDO (n=339) % (No.)	Un-adjusted <i>p</i> Value	Effect size <i>r</i>
SOL (min)	13.8±18.2	16.6±21.9	12.5±16.0	0.016 ^B	0.108
REM latency (min)	132±67.3	145±74.3	126±63.2	0.012 ^B	0.115
TST (min)	348±54.3	344±55.6	350±53.7	0.181 ^B	-
SE (%)	83.7±11.6	82.9±11.3	84.0±11.7	0.141 ^B	-
N1	11.8±8.91	11.6±8.53	11.8±9.09	0.966 ^B	-
N2	54.5±10.3	54.5±10.5	54.5±10.3	0.948 ^A	-
N3	17.1±9.43	17.6±9.77	16.9±9.28	0.583 ^B	-
REM	16.7±7.31	16.3±7.76	16.8±7.10	0.455 ^A	-
WASO (min)	53.8±39.4	53.7±37.2	53.9±40.5	0.755 ^B	-
AHI (events/h)	16.0±16.6	15.0±15.6	16.4±17.0	0.477 ^B	-
Arousal index (events/h)	22.8±14.8	22.3±14.4	23.0±15.0	0.638 ^B	-
Lowest oxygen desaturation (%)	82.2±21.6	81.7±22.5	82.4±21.2	0.601 ^B	-

^A Statistical comparisons between NDO and non-NDO groups with one-way ANOVA

^B Statistical comparisons between NDO and non-NDO groups with Wilcoxon rank sum test

^C Statistically significant according to post-hoc analysis with the BH-FDR controlling procedure

AHI apnea hypopnea index; SOL sleep onset latency; TST total sleep time; SE sleep efficiency; WASO wake after sleep onset

Results

Variable	NDO only (n=61) % (No.)	TRN (n=93) % (No.)	Un-adjusted p Value	Effect size metric
Demographics				
Age, years M±SD	37.5±10.3	38.0±8.17	0.413 ^B	-
Sex, Males % (No.)	67.2% (41)	77.4% (72)	0.193 ^B	-
Deployment, yes % (No.)	60.7% (37)	90.3% (84)	<0.001 ^{A,C}	1.49 (1.20 – 1.82) ^D
Self-reported measures, M±SD				
ESS score	12.4±5.07	13.1±4.86	0.396 ^B	-
ISI score	17.9±4.78	20.5±4.86	0.001 ^{B,C}	0.268 ^E

PSG variables

SOL (min)	16.4±24.5	16.7±20.1	0.921 ^B
REM latency (min)	143±67.8	146±78.9	0.762 ^B
TST (min)	342±50.3	346±59.0	0.173 ^B
SE (%)	81.8±10.3	83.6±11.9	0.070 ^{B,C}
N1	12.1±8.19	11.3±8.77	0.341 ^B
N2	56.7±9.62	53.1±10.9	0.059 ^{B,C}
N3	15.0±8.57	19.3±10.2	0.011 ^{B,C}
REM	16.3±6.60	16.3±8.46	0.909 ^B
WASO (min)	59.3±36.7	50.0±37.2	0.044 ^{B,C}

SOL (min)	16.4±24.5	16.7±20.1	0.921 ^B	-
REM latency (min)	143±67.8	146±78.9	0.762 ^B	-
TST (min)	342±50.3	346±59.0	0.173 ^B	-
SE (%)	81.8±10.3	83.6±11.9	0.070 ^{B,C}	0.146 ^E
N1	12.1±8.19	11.3±8.77	0.341 ^B	-
N2	56.7±9.62	53.1±10.9	0.059 ^{B,C}	0.152 ^E
N3	15.0±8.57	19.3±10.2	0.011 ^{B,C}	0.206 ^E
REM	16.3±6.60	16.3±8.46	0.909 ^B	-
WASO (min)	59.3±36.7	50.0±37.2	0.044 ^{B,C}	0.162 ^E

Nightmare Disorder in Military Personnel

- 3.9% reported nightmares as a reason for sleep evaluation
- 31% reported at least weekly nightmares
- 60% of those with NDO, reported having TRN
- More common with anxiety, depression, PTSD, and TBI

Sleep Quality in NDO/TRN

- 86% of those with NDO had insomnia
- Insomnia symptoms worse in TRN
- Sleep quality improved on PSG in TRN



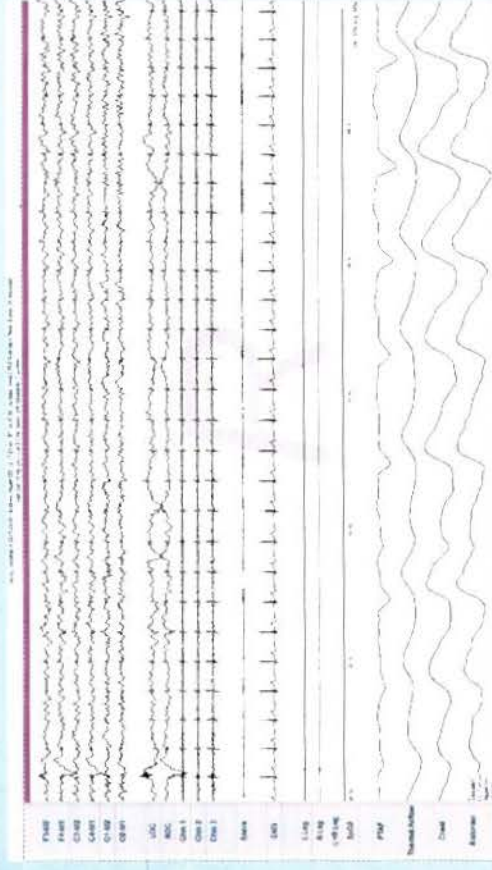
Conclusions

- Nightmare disorder is under-recognized in military personnel
 - Not exclusive to PTSD
- Presence of nightmares should be evaluated in military personnel:
 - After deployment/exposure to traumatic event
 - With mental health diagnosis/TBI
 - With sleep disorders
- Evaluation can lead to earlier treatment and improved outcomes

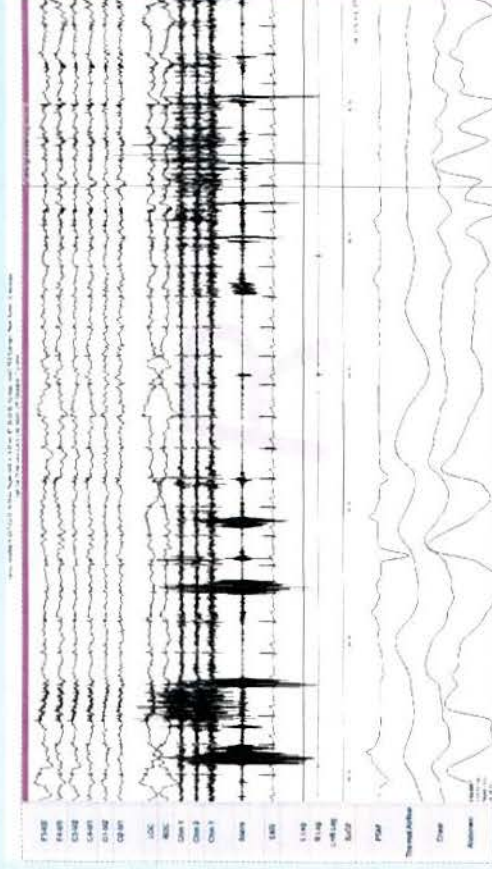
Acknowledgements

- Dr. Creamer
- Dr. Mysliwiec
- Dr. Matsangas

Observed Nightmare During PSG



First REM epoch of the night



Onset of DNB—pt screaming “No, No, Oh F**k!”

Title: An Initial Report on Nightmares in Active Duty Service Members with Sleep Disturbances

Abstract

Background: Sleep disturbances are common in active duty service members (ADSM) with previous studies focusing on insomnia and sleep disordered breathing. The prevalence of nightmares in veterans is higher than that of the general population. However, the rate of clinically significant nightmares and contribution to disturbed sleep in ADSM is unknown. The purpose of this study was to describe the frequency and associated clinical characteristics of nightmares in ADSM.

Methods: Retrospective review of 500 ADSM who underwent an evaluation and polysomnogram (PSG) at our sleep center. Scale scores and item-level data from the Pittsburgh Sleep Quality Index (PSQI) and the PSQI-Addendum were used to characterize ADSM either with or without clinically significant nightmares. Subjective and objective sleep characteristics to include the Epworth Sleepiness Scale, Insomnia Severity Index (ISI) scores as well as PSG variables, biometric parameters, and behavioral medicine disorders [anxiety, depression and posttraumatic stress disorder (PTSD)] were compared between groups.

Results: The rate of clinically significant nightmares was 31% utilizing the criteria of having bad dreams at least once a week on the PSQI; yet, only 4% reported nightmares as a reason for their sleep evaluation. Nightmares were related to prior traumatic events in 62%. On PSG those with nightmares had an increased REM latency (mean 145 minutes) compared to those without (mean 126 minutes, $P=0.006$). Characteristics associated with nightmares were depression (adjusted OR, 5.45 [95% CI, 3.45-8.61]), anxiety (adjusted OR, 3.85 [95% CI, 2.52-5.89]), PTSD (adjusted OR, 8.11 [95% CI, 4.91-13.40]), and insomnia (adjusted OR, 5.28 [95% CI, 3.18-8.78]).

Conclusion: Clinically significant nightmares are frequently present in ADSM with sleep disturbances when specifically queried. Nightmares contribute to both subjective and objective sleep disturbances. Individuals with mental health diagnoses and insomnia were at increased odds of having bad dreams. Nightmares are likely under-recognized in ADSM and treating this sleep disorder can improve the overall sleep and health of this population.

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